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# CLAIMS

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1. Pressure electrolyzer with an electrolytic cell block (3) that contains a number of electrolytic cells (4) combined in the form of a stack, wherein each electrolytic cell (4) contains an anode (11) and a cathode (12), and wherein the electrolytic cell block (3) has a sealed housing (5), characterized by the fact that the housing (5) of the electrolytic cell block (3) is formed by a number of stacked cell frames (15, 16; 25, 26) of the electrolytic cells (4); that the cell frames (15, 16; 25, 26) consist at least partially of a material (15a, 16a; 25a, 26a) that is elastic at least in the longitudinal direction of the electrolytic cell block (3) and seals adjacent cell frames (15, 16; 25, 26) from each other; and that the electrolytic cell block (3) is held in place between end plates (21, 22) under compression of the elastic material (15a, 16a; 25a, 26a).

2. Pressure electrolyzer in accordance with Claim 1, characterized by the fact that the cell frames (15, 16; 25, 26) have a rigid element (15b, 16b; 25b, 26b), which runs in the circumferential direction of the frame for mechanical stabilization of the cell frames (15, 16; 25, 26) and is connected with the elastic material (15a, 16a; 25a, 26a).

3. Pressure electrolyzer in accordance with Claim 2, characterized by the fact that the rigid element (15b, 16b) forms a shell-like frame structure, which partially encloses the elastic material (15a, 16a) and from which the elastic material (15a, 16a) partially protrudes to form a compressible region (15c, 16c) in the longitudinal direction of the electrolytic cell block (3).

4. Pressure electrolyzer in accordance with Claim 2, characterized by the fact that the rigid element (25b, 26b) forms a frame-like insert that is wholly or partially embedded in the elastic material (25a, 26a).

5. Pressure electrolyzer in accordance with Claim 3 or Claim 4, characterized by the fact that adjacent cell frames (15, 16; 25, 26) each have projecting parts (15d, 16d) and recesses (15e,

16e) that fit into each other for locking the adjacent cell frames (15, 16; 25, 26) in place and/or for sealing the adjacent cell frames (15, 16; 25, 26).

6. Pressure electrolyzer in accordance with any of Claims 1 to 5, characterized by the fact that each anode (11) has its own anode cell frame (15; 25), and each cathode (12) has its own cathode cell frame (16; 26).

7. Pressure electrolyzer in accordance with any of Claims 1 to 6, characterized by the fact that the elastic material (15a, 16a; 25a, 26a) consists of an elastomer or a soft elastic thermoplastic.

8. Pressure electrolyzer in accordance with any of Claims 2 to 7, characterized by the fact that the rigid element (15b, 16b; 25b, 26b) consists of a dimensionally stable material, especially a metal or a plastic.

9. Pressure electrolyzer in accordance with any of Claims 3 to 8, characterized by the fact that the rigid element (15b, 16b) that forms the shell-like frame structure consists of an electrically insulating material, especially plastic.

10. Pressure electrolyzer in accordance with any of Claims 1 to 9, characterized by the fact that the end plates (21, 22) form the power supply to the ends of the electrolytic cell block (3).

11. Cell frame for a pressure electrolyzer, which comprises an electrolytic cell block (3) that contains a number of electrolytic cells (4) combined in the form of a stack, wherein each electrolytic cell (4) contains an anode (11) and a cathode (12), and wherein the electrolytic cell block (3) has a sealed housing (5), characterized by the fact that the housing (5) of the electrolytic cell block (3) is formed by a number of stacked cell frames (15, 16; 25, 26) and that the cell frame (15, 16; 25, 26) consists at least partially of a material (15a, 16a; 25a, 26a) that is

elastic at least in the longitudinal direction of the electrolytic cell block (3) and seals adjacent cell frames (15, 16; 25, 26) from each other.

12. Cell frame in accordance with Claim 11, characterized by the fact that the cell frame (15, 16) has a rigid element (15b, 16b; 25b, 26b), which runs in the circumferential direction of the frame for mechanical stabilization of the cell frame (15, 16; 25, 26) and is connected with the elastic material (15a, 16a; 25a, 26a).

13. Cell frame in accordance with Claim 12, characterized by the fact that the rigid element (15b, 16b) forms a shell-like frame structure, which partially encloses the elastic material (15a, 16a) and from which the elastic material (15a, 16a) partially protrudes to form a compressible region (15c, 16c) in the longitudinal direction of the electrolytic cell block (3).

14. Cell frame in accordance with Claim 12, characterized by the fact that the rigid element (25b, 26b) forms a frame-like insert that is wholly or partially embedded in the elastic material (25a, 26a).

15. Cell frame in accordance with Claim 13 or Claim 14, characterized by the fact that each cell frame (15, 16; 25, 26) has projecting parts (15d, 16d) and recesses (15e, 16e) that fit into each other for locking adjacent cell frames (15, 16; 25, 26) in place and/or for sealing adjacent cell frames (15, 16; 25, 26).

16. Cell frame in accordance with any of Claims 11 to 15, characterized by the fact that each anode (11) has its own anode cell frame (15; 25), and each cathode (12) has its own cathode cell frame (16; 26).

17. Cell frame in accordance with any of Claims 11 to 16, characterized by the fact that the elastic material (15a, 16a; 25a, 26a) consists of an elastomer or a soft elastic thermoplastic.

18. Cell frame in accordance with any of Claims 12 to 17, characterized by the fact that

the rigid element (15b, 16b; 25b, 26b) consists of a dimensionally stable material, especially a metal or a plastic.

19. Cell frame in accordance with any of Claims 13 to 18, characterized by the fact that the rigid element (15b, 16b) that forms the shell-like frame structure consists of an electrically insulating material, especially plastic.